

Young Mathematicians (YM): Expanding an Innovative and Promising Model Across Learning Environments to Promote Preschoolers' Mathematics Knowledge

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INTRODUCTION

- Young children's math learning undergirds their cognitive development
- Early math skills build a foundation for later math, science, engineering, and problem-solving skills (Claessens & Engel, 2013)
- Early learning environments (e.g., school and home) are critical targets for math interventions
- Many early education teachers and families are not trained in evidence-based methods to facilitate meaningful math experiences

PURPOSE

Create a cross-context (school-home) intervention using innovative strategies to transform the math learning environments of preschoolers from under-resourced communities

PRIOR EXPLORATORY RESEARCH

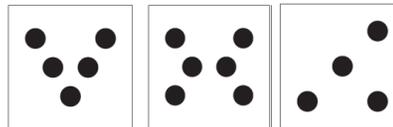
- EDC partnered with eight New England Head Start programs to develop and test the first *Young Mathematicians (YM)* program
- A 2016-17 study found significant positive effects of one condition of *YM* on (1) Head Start preschoolers' math learning, (2) teachers' instructional practices, and (3) family attitudes toward math (Young, Reed, Rosenberg, & Kook, 2019)
- More research is needed to fully develop, test, and refine *YM* for broad implementation and to improve effectiveness for younger and older children and dual-language learners

Connecting school and home mathematics provides preschoolers with a web of opportunity that promotes school success



Game: Same? One More, One Less?

Cards on table for children to choose from



Can you find a card with *the same* number of dots as mine?
 Can you find a card with *one more* dot than mine?
 Can you find a card with *one less* dot than mine?

CURRENT YM INTERVENTION

- Teacher PD course in early math
- Teacher and family guides and instructional videos
- Classroom math games
- Family math games aligned to classroom activities
- Family math mini-books

RESEARCH DESIGN

Year 1: materials design and development in partnership with five Northeast Head Start classrooms

Year 2: mixed-method implementation study with ten Head Start classrooms to ensure materials are engaging and comprehensible

Year 3: RCT field study with 40 Head Start classrooms to measure the impact of *YM* on preschoolers' math learning

Year 4: data analysis and dissemination of finalized materials for school and home

MEASURES

- The *Research-Based Early Math Assessment*
- The *Knowledge of Mathematical Development* teacher survey

IMPACT

- Promote strategies that support early math learning in preschools and homes
- Engender positive math attitudes in teachers and families
- Disseminate findings to academic, policy, and practitioner communities to improve math instruction and family engagement in math more broadly



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